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Packet Radio MAGAZINE

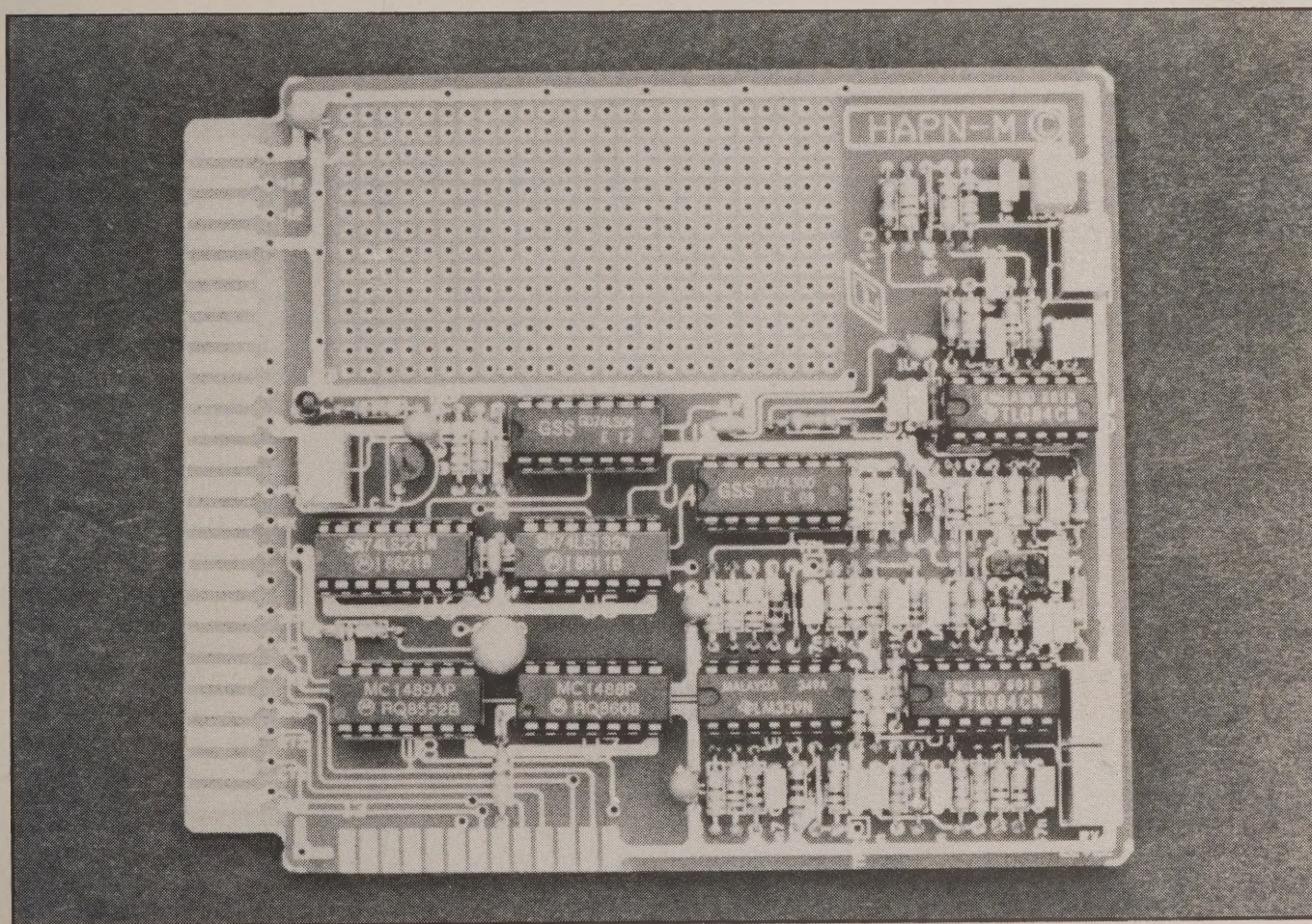
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March 1987

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Vol. 2, No. 3

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PACKET RADIO MAGAZINE

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Subscriptions to PACKET RADIO MAGAZINE are available through any of the participating organizations listed below. See individual club pages in this issue for information on how to contact these organizations. If there is no participating group in your area, you are encouraged to join FADCA or TAPR. See the TAPR PSR section for TAPR membership information. FADCA membership dues (US Dollars): United States = \$15.00, Canada = \$18.00, Foreign (airmail) = \$25.00. Credit cards are not accepted. Three dollars of each member's dues is allocated for FADCA operations, and the remainder is for the subscription to PRM. Major clubs wishing to participate in PRM should contact the FADCA office.

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PARTICIPATING ORGANIZATIONS

ALA-NET	- Alabama Packet Radio Association
CAPRA	- Chicago Area Packet Radio Association
FADCA	- Florida Amateur Digital Communications Association
GRAPES	- Georgia Radio Amateur Packet Enthusiasts Society
HAPN	- Hamilton and Area Packet Network
KCAPRG	- Kansas City Area Packet Radio Group
LAPRS	- Louisiana Amateur Packet Radio Society
MAPRC	- Mid-Atlantic Packet Radio Council
MARDA	- Mississippi Amateur Radio Digital Assn.
PAPA	- Pennsylvania Packet Association
PPRS	- Pacific Packet Radio Society
RMPRA	- Rocky Mountain Packet Radio Association
SCDCC	- So. California Digital Coord. Council
TAPR	- Tucson Amateur Packet Radio Corporation
UPRA	- Utah Packet Radio Association
WMPRA	- Western Michigan Packet Radio Association

PROPOSAL:
Standardizing BBS Forwarding Header Lines
Mike Chepponis, K3MC and Tom Teel, KB3UD

This may be a tiny detail, but we have been bothered by the various formats of the header line that each of our BBSs prepends to a forwarded message.

What we are proposing is a standardized header line. Look at this typical list of the header lines of a forwarded message:

[Currently "randomly disorganized" method]

Via K3MC R-861003/0739z S-861003/0817z Pittsburgh, PA (145.01)
R:861003/0701z S:861003/0738z KB3UD, East Bangor, PA, FN20jv
@K3RLI R-861003/0641z S-861003/0654z Wilkes-Barre, PA (145.01/145.05)
@N2AYY-1: #3683; R-861003/0430z, S-861003/0641z Glens Falls, NY
Via WA1FHB: 2578 From W6AXM R: 861002/2040z, S: 861003/0423z, Marlow, NH
Via WB1DSW: 8664 From W6AXM Rcvd 861002/1741z, Sent 861002/2042z
W9ZRK > #8768 In:861002/1523z, Out:861002/1731z
At WB6KAJ: 854 From W6AXM Rcvd 861001/1240, Sent 861002/0823
At W6AXM-1: 41 From W6AXM Rcvd 861001/1036, Sent 861001/1240

Now here is what we're proposing:

First 30 Columns
<-----Fixed Length Fields-----><-----Variable Length Fields----->

R:861003/0739z S:861003/0817z K3MC Pittsburgh, PA (145.01)
R:861003/0701z S:861003/0738z KB3UD, East Bangor, Pa, FN20jv
R:861003/0641z S:861003/0654z K3RLI Wilkes-Barre, PA (145.01/145.05)
R:861003/0430z S:861003/0641z N2AYY-1 Glens Falls, NY
R:861002/2040z S:861003/0423z WA1FHB, Marlow NH
R:861002/1741z S:861002/2045z WB1DSW
R:861002/1523z S:861002/1731z W9ZRK >#8768
R:861001/1240 S:861002/0823 WB6KAJ
R:861001/1036 S:861001/1240 W6AXM-1

- PRM -

DISCUSSION OF HEADERS Norm, W2JUP

Here are thoughts on the "headers" subject. First, let's put "message headers" in perspective by looking at the Commission's recent statement in Report No. DC-645, dated 10/9/86:

"Although it acknowledged assurances of safeguards by the ARRL for the A.25 packet protocol, the FCC noted that control operators capable of monitoring such transmissions must alert the control operator of any intermediate retransmitting station, under automatic control, of any station misuse so that corrective action can be determined."

To respect the FCC's directives and ensure minimum capability of PBBSS and network node to comply with FCC requirements, we'd best take a hard look at the real world:

1. THE ORIGINAL WORLI/WA7MBL FORMAT COMPLIES - LET'S STAY WITH IT FOR NOW!
2. DESIGN NEW HEADERS BASED ON NEED, FUNCTION AND LOGIC, NOT PRETTY PRINT.
3. DESIGN NEW HEADERS JOINTLY WITH CODE AND SWITCH DEVELOPERS.
4. DESIGN NEW HEADERS FOR MACHINE-READABLE ROUTING TABLE GENERATION
5. LEARN FROM COMMON CARRIER/PTT NETWORKS - DON'T RE-INVENT THE WHEEL!

MAKING YOUR KPC-1 LOOK LIKE AN MFJ-1270 (sort of)

W.C. Spenn, WR5Q

Box 33081

San Antonio, TX 78265

Recently I had the need to swap the same transceiver between a KPC-1 and an MFJ-1270. The KPC-1 requires an additional cable for audio from the transceiver to the TNC, which the MFJ-1270 incorporates into the 5 pin DIN plug. I checked the 5 pin DIN plug used on the KPC-1 and found that pin 4, which is used for audio from the transceiver to the MFJ-1270, is unused on the KPC-1. I also checked to make sure the 1/8 inch jack used to get audio from the transceiver on the KPC-1 was not grounded when a plug was removed. To make the KPC-1 5 pin DIN plug compatible with the MFJ-1270 DIN plug, you only need to solder a jumper from the 1/8 inch audio jack to pin 4 on the DIN socket. Now when I need to swap between the KPC-1 and the MFJ-1270 I only need to change one plug.

Here is a hint on how to get the KPC-1 PTT circuit to work more reliably than I received from Harry, W5UFC. Place a 10k resistor from the junction of the collector of Q3, R12, and R14 to ground. Harry has forwarded this modification to Kantronics.

Finally, if you are using one of the newer FM transceivers for packet, you may want to check the microphone connector for audio output present on one of the pins or a blank pin to which you may wire audio out. This will allow you to have only one cable between your TNC and transceiver.

- PRM -

FADCA > BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION

WRITE ONLY MEMORY

Ted Huf, K4NTA

My daughters, Debbie and Lynn, and I wish to thank all of my friends for your kindness and prayers in our time of loss.

Another attack is being made an Amateur Radio band. This time it is the 220 MHz band where we are starting to do packet radio networking here in Florida. In many parts of the country, 220 is already an important part of the network.

We MUST not lose the bottom two megs of 220. Our linking frequencies are in this section of the band and with novice enhancement here, the rest of the band will be filling up with novice voice operators. Lets get out there and write the FCC on this one. Please see the ARRL position and sample form to use when sending in a reply elsewhere in PRM.

Looks like 1987 will be the year of the network here in Florida. 220 digipeaters and dual port digipeaters are springing up all over. By the time this is published, I should have 305STU running with GATOR dual port switch code from Howie, N2WX on a DR-200. Howie already has 305MLB running the code and he is working on it to make improvements.

Seventy threes and see you all next month.

- PRM -

PACKETS FROM THE GAINESVILLE LAN

Ernie Secrest, WD4EPK

A lot has happened in North Florida in the last few months. So much that I will discuss each briefly. The previous BBS SYSOP, Scott Fox, KF4TT, has moved to New Jersey. I have taken over the BBS SYSOP tasks for Gainesville. So please forward BBS traffic for our area to WD4EPK BBS in Gainesville, FL. The GNV digi is on a temporary tower at W4TKE's house at 80 FT. on a 4 bay antenna. We will be moving to a permanent site at 550 FT. sharing the 146.22/.82 ant with duplexers to save feedline costs. We are hoping the new GNV will be active sometime in March.

Perry, FL is now on the air at 500 FT. with a top mounted 4 bay antenna. Its called PRY and has been on the air since the last week of February. Thanks to Donnie, KJ4ZI, and Gene, W4RTN, whose work made the PRY digi possible.

Valdosta, GA is back on the air also since mid-February. All I know is it is at 200 FT, has the alias VLD and IDs as KCOPA/R.

PRY has excellent connection to VLD and TLH, but is out of range of the temporary GNV digi and Jacksonville digis. We lost the site for IKC (Lake City, FL) so there is still a gap to the North. We hope the new GNV digi will help this situation, at least at night for the BBSS to forward traffic.

I have been offered a site in Cross City, FL and still need either some feedline or a pair of VHF/UHF splitters. This site would make the path from GNV to PRY solid and close that gap to the North. I also have sites available in Lake City and Melrose. I need rejection type duplexers and TNCs for these sites still. There is also the possibility of a site in High Springs but details are unavailable. The site in Cross City is at 500 FT. and is a high priority. If you know of any hardware for this site please let me know via my BBS.

73 for now from the GNVLAN. Ernie.

- PRM -

FADCA BOARD OF DIRECTORS MEETING

Chuck Harrington, WA4GPF

On February 28, 1987, the FADCA Board of Directors met at Orlando in a session which lasted nearly 8 hours; a brief summary of some of the topics discussed follows:

1. It was decided to prepare a new comprehensive Florida digipeater map to be included in a future issue of PRM.
2. FADCA will support the SOUTHNET Conference, which is to take place in conjunction with the Atlanta Hamfest. Ted Huf, K4NTA, will be a liaison person between FADCA and the Atlanta group.
3. FADCA will have a booth at the Orlando Hamcation, with packet radio related displays.
4. In response to the FCC NPRM proposing the relocation of the bottom 2 mhz of the 220 band to the Land Mobile Services, the Board will draft and submit to the FCC an official FADCA reply in opposition; individual radio amateurs are encouraged to reply as well.
5. The Board of Directors is enthusiastic in regard to Novice Enhancement, and encourages that "Network Entry Ports" be developed in support of Novice Packet operations.
6. The Board compiled a preliminary list of packet enthusiasts to participate in the new PNC (Packet Networking Committee), thus providing for the tech-

nical and regional representation necessary to support the networking effort. Those already nominated will receive notification by mail within two weeks. Anyone who does not receive a letter and wishes to serve on the PNC is encouraged to come forward. Ted Huf will serve as the temporary chairman of the PNC.

7. The Board voted to continue and expand the PNC (ex FNCC) Regional meetings, as FADCA General Membership meetings, to discuss both packet radio networking and operational topics. The suggestions gathered at these meetings will be taken back to the PNC and the Board of Directors. The next meeting will be held at the Orlando Hamfest on the afternoon of Saturday, March 14. All persons interested in packet radio are encouraged to attend these meetings.

8. The next Board of Directors meetings is tentatively scheduled for the middle of May; exact date and location to be determined later.

The Board also received reports on the present 220 networking effort, including the status of various hardware and software.

- PRM -

PALM BEACH PACKET GROUP KICKOFF

Bill Piazza, KB4QVY

The first meeting of the Palm Beach Packet Group was held on Thursday, February 26, 1987 at the Emergency Operations Center, Belvedere Road, West Palm Beach. Ted, K4NTA and Henry, WA4HXZ co-chaired the meeting, which was attended by 21 hams interested in promoting packet radio in South Florida.

The first part of the meeting was an assessment of where packet radio has been in South Florida and where it is going. Items discussed included TNC hardware, bulletin boards, NET/ROM, 2 meter frequency allocation, the 220 MHz backbone, dual port digipeaters, roundtables, etc. The underlying theme was that packet radio is maturing and the days of true networking over long distances with minimal retries are not far off.

The second half of the meeting was a discussion about how the amateur community should support the build-up and maintenance of the network. The point was made that much of the equipment currently being used (especially in "key" locations) belongs to private individuals who could move, lose interest, or otherwise reclaim their investment at any time. Another key point was that if any "holes" exist in the overall network, everyone suffers, not just the hams in the immediate vicinity of the "missing digipeater". The goal should be for each geographic area to set up the equipment necessary to serve the hams in that area and to prevent "holes" in the network.

After considerable discussion, the group agreed upon the following points:

1. The group will keep the name Palm Beach Packet Group, at least until we think of something better.

2. We will approach the Palm Beach Amateur Radio Council at their next meeting on March 19, 1987 to propose that they act as a parent organization and trustee of any equipment funded by PBPG. In the event that PBARC is not interested in that arrangement, we will consider forming our own club. (The consensus was that there are already enough amateur radio clubs in Palm Beach County and what is really needed is for one of them, preferably one with influence over a wide area, (such as PBARC) to sponsor activities related to packet radio in the county.)

3. The purpose of the Palm Beach Packet Group will be to establish a working group (under the auspices of the Palm Beach Amateur Radio Council) to study the South Florida packet network environment and to recommend, fund, and install equipment to serve the needs of the South Florida packet radio community (Palm Beach County in particular). An immediate goal is the establishment of a 2M/220MHz, dual port digipeater in the central part of the county. This digipeater will eventually be equipped with NET/ROM software and will form a vital link in the network.

4. A Technical and Funding committee were formed.

5. It was estimated that at least \$500 - 600 would be needed to get one dual port digipeater on the air in the WPB area (using used radios).

6. Many attendees at the meeting volunteered money from their own pockets to "get the ball rolling" - a total of \$205 was collected. (Not bad!) Lou, K4ZRP, will act as temporary treasurer.

7. Bill, KB4QVY, will act as temporary secretary and make the minutes of the meeting available for posting on Packet BBSSs, in the PBARC newsletter, and to other local clubs.

8. Henry, WA4HXZ, and other members of the PBPG will attend the March 19 meeting of PBARC to make the proposal that PBARC sponsor the group.

So c'mon Palm Beach County packeteers - we use the network, we stand to benefit from its enhancement and maintenance - so let's support it and let's get Florida back on the map as a leader in amateur packet radio!!

- PRM -

FADCA MEMBERSHIP FORM

See the PRM Masthead page for subscription details. Send the information below to the FADCA address.

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From: American Radio Relay League / President Larry Price, W4RA
Via: Hudson Division Director / Stephen Mendelsohn, WA2DHF
TO: All radio amateurs

Here is a statement of the League's position and opposition to reallocation of 220-222 MHz:

ARRL PLANS STRENUOUS OPPOSITION TO FCC 220-MHZ REALLOCATION PROPOSAL

The American Radio Relay League is formulating the strongest possible opposition to an FCC proposal to reallocate 2 MHz of the 220-225 MHz Amateur Radio band to the land mobile service. The Commission's proposal was released February 12 in a Notice of Proposed Rule Making in FCC General Docket No. 87-14.

In commenting on the Commission's proposal, ARRL President Larry Price, W4RA, said: "Let no one question the League's resolve to fight, with every means at our command, this unwarranted spectrum grab on behalf of commercial interests. Amateurs need this band - all of it - if we are to fulfill our public-service charter." Mr. Price noted that if the proposed reallocation were to be made, high-speed intercity data links vital to the future existence of the amateur packet radio network would be completely disrupted. "The FCC has just opened the packet radio revolution to Novice operators, and now it proposes to cripple the very network they will need in order to use the medium effectively," he said.

The 220-222 MHz band is also used for control and auxiliary links required for repeater and remote control operation, as well as for advanced amateur communication such as earth-moon-earth (moonbounce) and for research into unusual propagation modes. These uses cannot be accommodated in the band above 222 MHz without serious disruption of previously coordinated repeater stations.

"For 15 years, the threat of commercial exploitation of 220 MHz has slowed the growth of Amateur Radio activity in this band," Mr. Price observed. "In spite of this, the growth rate has been phenomenal, far outstripping land-mobile growth rates in the same period. Now, after twelve years, the FCC has finally granted the League's longstanding request that the band be opened to Novice operators. It makes no sense at all for the Commission, on the heels of that action, to say that the band is 'lightly loaded.' I'm confident that an objective comparison of our needs with those of commercial land mobile will show that the public interest lies with maintaining the amateur allocation."

Comments on the FCC proposal are due at the Commission April 6. Individual amateurs wishing to support the League position are urged to submit an original and at least five copies to the Secretary, FCC, Washington, DC 20554. "General Docket No. 87-14" should be mentioned prominently at the top of the first page.

If there are any questions on where the League stands on this matter please let me know. I will attempt to answer them as time permits. Address all questions either to my home address, Stephen Mendelsohn, WA2DHF, ARRL Hudson Division Director, 318 New Milford Ave. Dumont, NJ 07628, or via my home BBS KD6TH-1.

- PRM -

Subj: How to comment to FCC
To: The Amateur Radio Community
From: Phil Bradway, KB2HQ SGL/ENY, Chairman NYS Packet Forum

In the wake of the current 220 mess, I've seen some questions on how to submit comments to the FCC. The sample format following is one we've used successfully for a few years and may be of help to those new to the process. There are really no hard and fast rules on format, however, a bit of formality has a way of making the argument more credible. I hope this will be helpful in the quest for saving 220 and in future cases.

The strongest and most influential comments are those that lay out logical, pointed and technically accurate arguments addressing the specific points brought up in the FCC action. It pays to have a copy when preparing you comments! The comments that are N O T needed, are those that make reference to the Commission's lineage, mental competency and things of that nature! Just stating that you don't like a particular FCC proposal is not the answer.

The original and 11 copies, all signed, should be sent to the Commission at the Washington DC, 20554 address with the docket number clearly marked on the outside of the mailer. The Deadlines are important. If you really need more time to prepare a good comment, put in a brief one meeting the deadline and send in the fully developed one as a reply comment or as additional information.

SAMPLE FORMAT:

Before The
THE FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of:

Amendment of Part 2	)	General Docket No. 87-14
of the Commission's	)	RM-4829
Rules Regarding the	)	RM-4831
Allocation of the	)	RM-4983
216-225 MHz Band	)	

To: The Commission

COMMENTS

The first paragraph should be used to establish who you or your organization are. Add anything that will strengthen the message that follows, such as the

Continued on page 16.

HAPN

Box 4466, Station D,
Hamilton, Ontario,
Canada, L8V 4S7

HAMILTON AND AREA PACKET NETWORK

HAPN BULLETIN #7

John, VE3DVV

H.A.P.N.

Box 4466, Station D,
Hamilton, Ontario, Canada, L8V4S7

Here are some updates on the activities of the HAPN packet radio club.

Our main repeater site at Erin Mills, Ontario, has been converted over to 4800 baud. The repeater frequency is 145.65. The turnaround time (time between reception of a frame to repeating the frame) has greatly improved and is now around 50 msec. This time includes CTS delay (TXdelay), which accounts for about 25 msec. The improvement is due to the fact a Xtal controlled radio is used and the modem squelch is used in place of the radio squelch. Regular synthesized base stations with longer CTS delay (TXdelay) have no problem working through the repeater and also benefit from the faster turn around of the repeater. However some may not see or hear their own packets being repeated. This is due to the fact their radio is still switching over to receive from transmit when the repeater is already repeating the packet. The range of the repeater is comparable with the old 1200 baud modem before.

Also our HAPN PBBS is now operational on 4800 baud and is working very well using a PC-XT and the HAPN-1 packet adapter with the 4800 modem added to the prototype area. The software has been improved by adding more libraries to the PBBS data base. On line we have SSTV and TELIDON (video text) pictures for access via packet. We use the SF/RF file transfer protocol to transfer the binary files. A description of this efficient file transfer protocol was published in the 1986 February issue of PRM (Packet Radio Magazine).

4800 baud on TAPR TNC-2

We completed a test of a modified HAPN-4800 modem card (bypassed our RS232 interface) and a TNC-2 using a ribbon cable to connect the two. The TNC-2 works well at this baudrate. The power for the modem was taken from a wall type transformer. A circuit to allow switching between 1200 baud and 4800 baud is also being tested.

HAPN BULLETIN #8

The first run of beta HAPN-M 4800 baud modem cards have been assembled and tested by our club members. Areas now testing the modem are the HAPN in Ontario, VADCG in Vancouver, the SADCG in Sydney, Australia, two states in the USA and a group in Belgium.

Since this modem is primarily designed for experimental purposes with the VADCG TNC it features an RS232 interface to the TNC, a hardware CTS delay, a watchdog and a prototype area (see included picture). The modem needs a direct hookup to the modulator (FM or PM) and the discriminator of the radio (no microphone or speaker hookup). The primary advantage of this modem is that it works with regular 2 meter radios at four times the baudrate and same bandwidth as the conventional 1200 baud modems. It further features a fast-on modem squelch and simple construction. There are a total of 4 pots to adjust. They are : RX level, TX level, Squelch and CTS (TXdelay). The board is silkscreened and solder masked and has a gold plated 22 pin edge connector.

We have been getting more requests for the modem and decided to make another run of them. However we don't have the time to assemble and test them so we will only make them available as bare boards. The parts should be easy to get. The price is \$30 Canadian or \$25 US each for 1 or 2 boards. For 3 or more boards \$25 Canadian or \$20 US each. The board includes a diagram and notes. Postage is included for the US or Canada. For overseas orders add \$3 for shipping.

The boards are intended for individual experimental purposes only and OEMs should contact HAPN directly if interested.

HAPN BULLETIN #9

15-mar-87

The club's 4800 baud modem project is switching into high gear. HAPN-1 TNC's can now make use of the prototype area on their boards to add a 4800 baud modem. The modem is designed to work with your regular 2 meter radios in the same bandwidth as regular 1200 baud modems. For more modem information see our previous HAPN bulletins.

The 4800 baud modem instructions have now been written and diagrams plotted. We are ready for the testing. Anyone having a HAPN-1 packet adapter card and is experienced in building can participate. To make it easy for all the participants, and encourage a fast turn around on the feedback we will do as follows :

1. For the first 25 participants HAPN will make parts kits available.
2. Two diagrams of your radio radio are requested. One will be returned with comments about the suggested interface points to the modem. The other will be kept on file by HAPN.

Continued on page 16.

MARDA

The Official Newsletter of the



MONITOR

Mississippi Amateur Radio Digital Assn.

Patrick J. Fagan, WA5DVV
President, MARDA

MARDA-ON-THE-GROW

MARDA had a large increase in membership during the month of February. Many new members joined at the Jackson HamFest, while others sent in their application a few days later. Many thanks for your support. It was great to see all of you again this year.

VICKSBURG TO TEST "NET/ROM":

Bill, WB5SXX, says the Vicksburg LAN plans to test "NET/ROM" in a couple of weeks. "NET/ROM" is the new firmware package for the TNC-2 and work-a-likes which supports state-of-the-art networking capabilities. An overview of this system was presented in last month's PRM.

Vicksburg's DIGI {VKS} is in a great location for this test. It hears Baton Rouge, Monroe, Bastrop and Jackson. If the results of this experiment prove successful, the Gulf Coast LAN will be implementing the firmware at BIX as well.

GULF COAST LAN DIGI IS DOWN:

GPT is off the air temporarily because of antenna failure at BIX. I know that statement sounds confusing but I will try to explain.

BIX uses a Hustler G-7 antenna mounted on the side of the STL tower at WLOX-TV. Those of you familiar with this antenna know its only support is at the base. It survived Hurricane Elena, but didn't make it through the recent high winds experienced during a thunderstorm here on the coast. Our best guess tells us Elena weakened it and the thunderstorm finished it off. The break came at the bottom of the first fiberglass section.

The story gets more interesting as we go along. When the antenna fell, it managed to go through the roof of the TV station. The damage was discovered when WLOX-TV's Chairman of the Board unlocked his office early Monday morning following the weekend storm. It seems he discovered a strange looking aluminum rod sticking through the ceiling. Of course this wasn't noticed at first, but the wet floor, desk and chair prompted the look toward the ceiling for the cause of the leak!! My office is two doors down the hall from where the antenna entered. Needless to say, I took a little ribbing from my fellow workers.

In order to get the TRUNK (145.01) back on the air we went to the LAN DIGI site {GPT is about four blocks up the road} to make some temporary changes. GPT's TNC was reprogrammed to BIX and the radio was

changed from 145.09 to 145.01. Most users never discovered BIX was down. However, the absence of GPT on 145.09 has been quite evident. We are using N5HND as a digi on the LAN frequency in the interim.

If weather permits, a new G-7 will be installed on March 14. Special bracing has been devised to prevent the antenna from falling to the ground should it meet with another high wind. Thanks in advance to KA5HOP, W4WLF, K4JHE and N5JRJ for their help in restoring GPT to operating status. By the time you read this, the DIGI should be back on the air.

BIX and GPT are running almost identical equipment and comparable coverage has been realized from both sites. The TRUNK frequency has not seen a compromise in performance since this change.

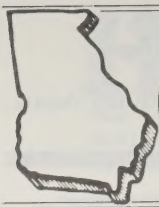
BBS'S - USEFUL OR USELESS:

Although I have been reluctant to write about this topic, the time has come for someone to get up on the soapbox. I recently took a look at the progress we've made in our regional VHF NETWORK over the last 12 months. MARDA has a path from the Gulf Coast to Laurel/Hattiesburg, Jackson, Vicksburg and recently (with the addition of MEI) to Meridian. MEI has a path to Montgomery, AL, although it is not 100% at this time. All of these areas have a BBS with the exception of Meridian. I understand that there is a plan underway to add one in this LAN very soon.

The Gulf Coast also has a path to the LAPRS NETWORK in Louisiana. MARDA interfaces with LAPRS at Slidell (SIL) and also via a Vicksburg to Monroe/Bastrop/Baton Rouge path depending on conditions. Message forwarding throughout most of LA is now commonplace with 24 hour delivery to most LAN's. In Mississippi we do quite well from the coast to the central part of the state, but that's about it. Activity in the northern end is isolated and very little input is received from PACKETEERS there. This brings us to the bottleneck we have been forced to live with during the last year.

The Alabama NETWORK (ALANET) has done a fine job establishing a reliable path from the top of their state down to Opp, AL (near Dothan). A 440 Mhz backbone system is running in some of the LANs as well. But then we reach a roadblock. The path from Opp to Mobile is very poor. The KB4FSK BBS (Opp) forwards to the WA5DVV-1 BBS in Gulfport through a minimum of three DIGIs using a very marginal path. Mobile has one DIGI on the trunk, a planned digi on their LAN frequency and the equipment to install a backbone system on the 440 Mhz band. But absolutely NO plans have been made for a BBS to serve their users on any of these frequencies. This area has not affiliated with their own state packet association (ALANET) and, to my knowledge, has not sent a repre-

Continued on page 22.



GRAPES

President: Dee Knox, K14QZ
Vice-President: Randy Jarrett, WA4MEI
Secretary: Eric Ellison, AA4SW
Treasurer: Garey Barrell, K4OAH

EAL (.03) Status Report

At our December meeting we ratified our constitution and bylaws and elected new officers for 1987. Elected President was KE4ZV, Vice President W8KJM, Secretary WB4HXE, and Treasurer KA4IAR. Dues were confirmed at \$15 for full members and an associate membership was created at \$5. Dues payable by June 1 of each year and prorated for part year membership.

Committee chairmen were AA4SW for technical committee, W4BIW for satellite gateway committee, W8KJM as meeting committee chairman, and AE4Q as BBS liaison.

A resolution was passed to have MAT-PARK take over the LAN BBS from KA4OVX with AA4SW loaning the equipment to start the system. It is hoped that this will assure continuity of BBS operations.

A resolution was passed that beaconing on the EAL be strictly limited to the primary mail BBS with a minimum of 30 minutes between beacons. All other beacon operation is strongly discouraged. An exception to this rule was noted for informational beacons that may be desirable from time to time. Such beacons should be limited to not more than a 48 hour period and should follow the minimum 30 minute between beacons rule as well. Of course beacons of an emergency nature are always allowed.

Several high volume servers are (or are planned to be) in operation on the LAN. A directory of these servers will be posted on the primary mail BBS. They are NOT to beacon.

AA4SW was instructed to investigate the feasibility of using a Paccom dual port TNC on the LAN digi instead of continuing with the construction of our own dual port board. Plans to discontinue operation of the KF4JJ-1 digi in favor of the lower site (KE4ZV-1) on the same tower were discussed and will be implemented shortly.

W4BIW reported that satisfactory RF connectivity now exists with the FO-12 satellite and that the autotrack antenna system is now fully operational. The G3RUH modem board is in hand and the gateway BBS is nearly ready.

The next regular LAN meeting will be back at Mountain Park and will feature a hands on tutorial on proper packet operation and BBS usage aimed at the newcomer and old hand alike. Our thanks to WB4HXE for arranging for us to meet at his work place this month and to W8KJM for his valiant efforts to steer the lost sheep to the meeting.

Georgia Radio Amateur Packet Enthusiasts Society
P.O. Box 443 Duluth, GA 30136

Meeting: 4th Saturday, Western Sizzlin, Buford Hwy., approx 1 mile north of 285, just south of Ham Radio Outlet, 10 a.m. to Noon.

Dues: \$20.00 per year (includes subscription to Packet Radio Magazine.)

GRAPES DIGIPEATERS

145.01	WB4GQX-1, Sawnee Mtn., Cumming
145.01	WB4GQX-2, Thomaston, GA
145.01	NC4G-1, Rome
145.01	W4DSK-1, Lookout Mountain
145.01	WA4TXT-1, Hampton
145.01	WB4BXO-1, LaGrange
145.01/.09	WD4OQC, Cleveland, TN Gateway
145.01/.09	WB4GQX-3, Sawnee Mtn., Cumming, Gateway
145.09	WB4GQX-4, North Georgia LAN Amicalola
145.09	AA4EO-1, Fairmont
145.09	W4GZX, Cleveland, TN
145.03	KF4JJ-1, East Atlanta LAN, Ch 11 Tower, 970'
145.03	KE4ZV-1, East Atlanta LAN, Ch 11 Tower, 630'
146.13/73	KD4NC-1, West Atlanta LAN, Sweat Mtn., Duplex
224.9	Lockheed (Marietta)
14.103	K4BYK, Cumming
3.696	WB4GQX, Cumming (Southnet Experimental)

TADS/NORTH GEORGIA (.09) Status Report

The January meeting of TADS/North Georgia LAN was held January 6th in Calhoun, Georgia and the following officers for 1987 were elected: President, WD4OQC, John; Secretary/Treas, WB4GQX/WB4OSD, Dennis/Kay; and Technical Advisor, K4TQL, Bruce.

Congratulations to all and we hope that this year provides the same forward movement that we enjoyed during 1986.

In order to help with some coverage problems in the northwestern end of the state, another new LAN digi (145.09) has been placed into service. The call is WQ4B-1 and it is located on Missionary Ridge. Thanks to the John Ross ARC for providing the tower and the antenna.

NC4G-2 is still under construction and should be on the air by the next LAN meeting. The site for NC4G-2 will be the same as the famous 147.90/30 voice machine. Frequency for the digi will be the now famous 145.09. Sometimes it seems that all we know how to do as a LAN is put digipeaters on the air, HI HI. But with the problems which some of our members have crossing the mountains, it does seem that they are needed.

Thanks to all of the "get it done" folks who are seeing that it is getting done. At times, it may seem that the number of LAN digis that we are putting on might be a little high. There are, however, coverage problems that will just not go away. VHF and mountains do not get along well together. The primary concern is that each and every member of the LAN has a digipeater that they can use and that no one is "left out." So far, interference has not been a problem, but even if it might come to having to live with a limited amount of digipeater QRM, it still will probably be worth it if it allows us to be sure that every mountain valley is covered.

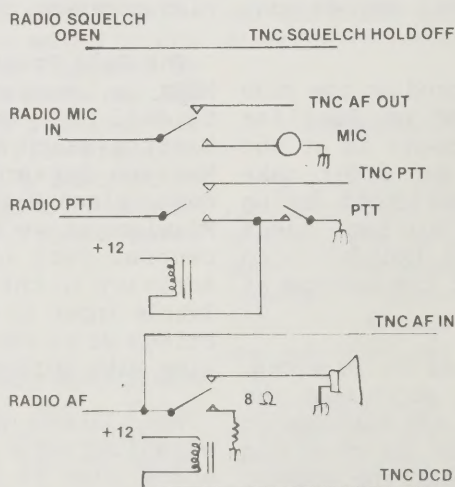
W4GZX has been moved to 145.01 from 145.09 for testing. Final positioning of the digi's frequency will be announced later by WD4OQC.

The K4BYK 20 meter digipeater has developed a problem with an RF transformer. A new transformer has been ordered and should be here soon. The digipeater may be on/off the air from time to time depending on the weather. Rain produces antenna problems due to the defective transformer. Frequency remains 14.103 MHz and service is still 24 hours per day so long as it is dry.

Is there any new service that you need the BBS to provide to you? We have a lot of memory storage left (multi meg) and if there is something that you think would be of interest or help to the LAN, please let us know. WD4OQC is looking for new and creative ideas. So ... start thinking.

The next meeting of the LAN will be February 3rd. Be sure to mark your calendar now.

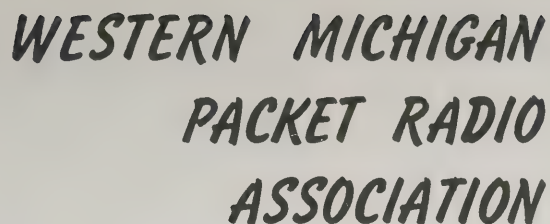
73, C U then
 WB4GQX/Dennis



Voice & Packet Are Compatible

By: Gary/KE4ZV

Using this interface voice/data use of the radio channel is possible with little conflict. Voice users have priority because the TNC will simply retry if held off by voice user. TNC DCD will inhibit speaker so voice users won't have to listen to data. Radio squelch signal will inhibit TNC from transmitting while voice users are transmitting. Consult your TNC manual and your radio's schematic for connection of Radio Squelch.



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WMPRA MEMBERSHIPS / PRM

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If you would like to be a member of the Western Michigan Packet Radio Association, an ARRL affiliate, please complete the below application and send it and your dues to:

WMPRA
PO BOX 4612
Muskegon, Mi. 49444

Name _____ Call _____

Address _____

City _____ State _____ ZIP _____

Are you an ARRL Member? _____

Home TX Number _____

Are you active on Packet? _____

The monthly WMPRA newsletter, "PACKET RACKET" will be published in the PACKET RADIO MAGAZINE (PRM).

WMPRA full membership with PRM \$15.00/yr
WMPRA full membership W/O PRM \$ 5.00/yr

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THOUGHTS ON NETWORKING

By WA8URE

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The above local activities, all point out how the 144.93 network is growing, as a "West Michigan" frequency. Maybe it sounds blunt, but I am convinced that this frequency should not be used in Michigan outside of the West side of the state. A very large telecommunications company has more experience than us, and I think if you look in the phone book of Michigan Bell, and study the area codes, that if Michigan develops area frequencies along the Bell networks area codes, that we can realize better use of frequencies. I would like to suggest the 144.93 frequency as the '616' area code frequency. Fine one might say, but then how do the different groups within the state talk to each other, particularly the bbs's with traffic? Shouldn't that all be on 145.01? At this point, having everything on 145.01 is like having every town having its wide coverage voice repeater on 34/94! It just don't work. To that end, and due to the fact

that the 'eastern boys' of the state where either very smart, or cowards of 01, and found themselves on 220, we are in the process of installing a 220 back-bone network. The large N8BMA bbs in Detroit is on 220, and there is a wide coverage digi in Ann Arbor of K8QKY-1 that can reach it. So, once again, with the help of Arlyn, K8EFK, we will be installing a 220 digi in the Lansing tower site of Arlyn's company. From there, we will go to the GRR site of 144.93, and like everyone else, awaiting the dual port Pac-Comm TNC, will cross connect the 144.93 network to the 220 east side network. The 220 rigs are here, and the antenna's ordered and it is hoped to have the system on line by the end of March. This will give Michigan a very solid east-west linking of the bbs's, without any interference to/from the 2 meter side. Many thanks to Jeff, KA8DNO with his help on designing the rf side of the network.

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LOCAL ACTIVITIES

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GRAND RAPIDS: from Tom WA8URE
The new year of 1987 started out a little different for packet in the West Michigan Area. The wide coverage digi of K8EFK-1 or GRR, which has been on 145.01 for the last 2 years, moved to the 144.93 frequency. This was done to get away from the problem that seems to be cropping up everywhere on 01. Basically, nothing was working. With all the rag-chewing, dx'ing, and bbs'ing all going on at once, something had to give. Since the move, network performance is like it was 2 years ago! Also, the commercial RCA Tac-Tec radio that was in use, did not like its receiver moved from 158 megs down to the 145 area, and was rather deaf, so a ARR gas-fet preamp was install to take care of that. Now the GRR digi seems to be in fine shape. The transceiver is running about 30 watts out, into a commercial antenna at the 500 foot above average terrain point of the tower, fed with 7/8 hardline. A magnificent site indeed, and one might ask, how do you get on a site like that. Easy, if the owner is a ham! Then put his call on the digi, such is how its named K8EFK-1, for Arlyn, one of our strongest supporters in this area for packet.

CADILLAC: from Tom WA8URE

After a period of seemingly no growth in packet in West Michigan, we got a two-pronged spurt in two different areas. After Len, N8AGS gave a packet presentation to the Cadillac area, it took that group only 4 weeks to have 5 stations on line, including a very nice wide coverage digi on 144.93. Welcome to N8GFL, WA8SUE, WA8IPJ, KX8Z, and WD8RZL, all from the Cadillac area. They all got together and purchased a MFJ TNC, added a Kenwood 7400, and, with the help of their commercial site landlord, duplexed the 144.93 digi into the 146.37/97 voice repeater transmitting antenna at the 250 foot level of the tower. The tower sits at 1950 feet AMSL, which is the highest spot in the lower peninsula, and with the antenna being fed with 7/8 hardline, and the fact of it being a Super-Station Master cut for the 2-meter band, it works out extremely well. The call is N8GFL-1, and the alias is CAD. Congratulations on a real nice piece of work guys. A side note here. This group is working with some in the Traverse City Area, who hope to add a digi to the 144.93 network soon, and this should help get a network right up along the coast to the Bridge.

SOUTHERN WEST MICHIGAN: from Tom WA8URE
Then, switching to the south, 3 guys from the Sturgis/White Pigeon area are on line, at this time. Makes me wonder, if this bbs is known as the White Pigeon BBS, will traffic for this area become known as Pigeon droppings?

HOLLAND: From Tom WA8URE

Also, a big thanks to Laryn, WA8TVZ for his help as a digi with his real nice signal while all the bugs were squeezed out of GRR.

HOLLAND: From Len N8AGS

Also the KJ8C BBS has been working flawlessly to support the needs of the WMPRA Networks. He has been having good results with mailforwarding, Etc. He has had troubles with people picking up their mail and has indicated that some of the old mail that is not picked up will be deleted from the mail file after a reasonable period of time.

SPRING LAKE: The MKG digi, on 145.010, seems to be working well into Wisconsin area. I have placed it on a 11 element

beam located at 175 feet. It has hard line, 130 watts and a 15 db preamp. Reports indicated that it has a S9+ signal over there. The WMPRA digi, on 147.560, has appears to be working well. I have reduced it's power to 25 watts and taken it off the super station master antenna. It is now on the west vertical antenna at 175 feet.

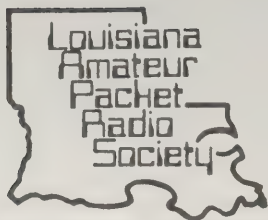
MUSKEGON: From Len N8AGS

Dan, KA8SKR has placed a BBS on at his station. His station has been the backbone of the 145.050 network. This network has been in operation for some months now and is centered on the Muskegon area. Dan's BBS is running on a Model 100 Radio Shack computer with one, soon to be two drives. it is very responsive to commands and appears to be faster acting to end user commands than the WORLI Zerox based BBSes. Keep up the good work Dan!

DXers Build a "New Home"

By WA8URE

Lastly, while much has been going on with the 144.93 network, some of you might not be aware of a grass-roots network on 145.03 Here is a great group of guys who have established a fine network of digi's, for rag chewing and dx'ing. No bbs's need apply or appear!! I have operated on the network, and it reminds me of 145.01 about 3 years ago, before bbs's were in this area. I believe the hope on this frequency is to keep it clean from bbs's, and heavy duty file transfers. It's amazing how the 8 digi path of AX.25 can work! Of the many stations, WA8TVZ in Holland, N8ERO in Midland, N8FLI in Montrose, WB8QWL in Flushing, N8BIT in White Lake, NR8D in Hazel Park, KA8SPW in Garden City, KA8MBK in Dundee, VE3KGW in Windsor, and others. These are basically 24 hour digi's/home rigs. Most of the operators can answer questions as to other stations on 145.03 Eventually a list will be made up of all known digi's, but you will have to go off 145.03 to find the bbs for the information! Try the WA8URE BBS in Grand Rapids, or the KJ8C BBS in Holland. If you are on packet in the lower part of the state, give the 145.03 network a try, life on packet without a bbs can be fun!



The Official Newsletter of the LOUISIANA AMATEUR PACKET RADIO SOCIETY

All of your LAPRS directors met at the Lafayette hamfest and we had a very useful meeting. There is much progress on filling in the gaps between the major metro areas. Work is now commencing on 440 MHz linking between BTR and MSY. LAPRS is now over 50 strong!

This month we are pleased to present the work of one of packet's pioneers in LA - Harry Rees, WB5BZE, of SIL digi and WB5BZE BBS fame. If you have any detailed questions, please feel free to contact Harry directly.

FREQUENCY AGILITY USING THE WA7MBL PBBS SOFTWARE AND A DUAL VFO RADIO

This article describes a system to automatically change the frequency of a dual VFO radio when running the WA7MBL PBBS software. This feature is needed if you are running your PBBS on a LAN frequency such as 145.03, but still need to forward traffic to other PBBS on some other frequency without duplicating all of the hardware needed for the second frequency.

I developed this system while using version 2.04 of the WA7MBL software and used it on the WB5BZE PBBS (145.03/145.01) for several months. I am now running version 3.12 and the system works just as well. The documentation for version 3.12 mentions that a user written program can be called from the FWD.BBS file in order to control the frequency of the radio when doing forwarding. This is probably a more eloquent way to do it, however, my method does not need a user supplied program. The only thing needed in the way of software is to add a few commands in the FWD.BBS file.

You will need a radio with a dual VFO that can be switched by an external relay. I use an Icom IC-290, in which I installed a small 5 volt reed relay (Radio Shack # 275-232) across the VFO A/B switch. You will also have to construct a circuit to plug inside the PC. This circuit monitors everything sent out to the COM port and turns the relay on and off when it sees a control "A" (HEX 01) being sent out the COM port.

As the first two entries, I added the following sequence to my FWD.BBS file:

```
GA0505^A (toggle relay on)
WB5BZE
*** EOF
GA1111^A (toggle relay off)
WB5BZE
*** EOF
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The symbol " ^A " is a control "A" (Hex 01). At the time specified in the first entry, a control "A" will be sent out to the TNC on the COM port specified in the CNF file. The TNC ignores the control "A", but the circuit that was added to the PC bus responds and sets a latch, which turns the reed relay on. The radio is now on the secondary frequency and will remain there until the time specified in the second control "A" sequence. At that time, a second control "A" is sent and the latch toggles off returning the radio to the primary frequency.

I used UTC and setup all the forwarding entries in the FWD.BBS file to take place between the two control "A" sequences. My forwarding time slot is 55 minutes past the hour. So, in the above example, the PBBS would switch to the secondary frequency at 11:55 PM and stay there until 05:55 AM. This gives ample time to send and receive traffic from the other PBBSs on the frequency.

In order to insure that the control "A" sequence will always be invoked, I had to send a "dummy" message to myself. This insures that I always have mail and since my call is listed under the control "A" sequence, the PBBS will always attempt to forward this "dummy" traffic at the specified time. I simply sent a private message to WB5BZE with zero bytes in it and make sure that I never read it.

You will need to find a text editor that will allow you to insert control characters into the text. I chose control "A", because it seemed to be the least used control character. To insure no control "A" characters are uploaded into the system, I set "MFILTER" to \$01 in the TNC. This will filter out any control "A" that might be in a user file. If any control "A" characters are embedded in a file it would cause the frequency to shift when that file was downloaded!

The circuit consists of three sections: Port Decoder, Data Decoder and the Latch Relay Driver. The Port Decoder decodes the address for the COM port you are using. The Data Decoder looks for a hex 01 being sent to the COM port and when one is detected, it sets the latch circuit. When another hex 01 is detected the latch is reset. The output of the latch flip-flop is fed to an open collector buffer driving a reed relay.

The circuit was constructed using wire-wrap technique on a Vector PC prototype board (Vector part #4613-2). That's all for this month. Please keep the packets coming. 73 de NE5S.

- PRM - Schematic on page 24.

Packet Status Register

March 1987 #26



Tucson Amateur Packet Radio Corporation

PRESIDENT'S CORNER

Lyle Johnson, WA7GXD

Packet and HF

There seems to be a lot of controversy these days about appropriate modem technologies to use for HF packet work.

In this case, fortunately, much of the controversy can be resolved by careful investigation from a technical standpoint.

In the January/February issue of PSR, Dan Morrison, KV7B (who designs modems and other signal processing devices for a living), and Eric Gustafson, N7CL (who is a careful measurer and observer of radio-based phenomena and is an electronics design engineer by profession), reported on some potentially significant findings they reached regarding HF packet operation.

The summary of the two articles includes the following points:

(1) EVERY MODEM TESTED WORKED BETTER WITH A 500 HZ IF FILTER IN THE RECEIVER'S PASSBAND.

This is for a variety of reasons, the most notable being (a) the S/N ratio is improved (b) the passband matches the spectra of the 300 baud 200 Hz shifted packet signal and (c) interfering signals are kept out of the receiver's AGC system.

Note that tested modems included the phase-locked-loop (PLL, in this case the XR2211 found in every TAPR and TAPR-clone TNC), all-digital units (specifically the AMD7910, found in the various Kantronics Packet Communicators) and the filter/slicer types (in this case, the AEA PK-232).

(2) COLLISIONS ARE A MAJOR REDUCER OF THROUGHPUT ON HF.

Collisions are caused when a TNC decides that no other station is transmitting, so it goes ahead. TNCs depend on accurate data-carrier detect (DCD) information from the modem. PLL demodulators are the most reliable providers of DCD related to packet signals, and better able to reject other signals as QRM (eg, foreign broadcast stations on 40 meters).

(3) Extensive testing in a well-documented manner, operating equipment in strict accordance with manufacturer's instructions, has provided evidence that the lowly TAPR PLL modem, when properly adjusted, will outperform any and all Amateur HF packet modems when operated as described in the articles!

(4) A TUNING INDICATOR IS A NECESSITY FOR GOOD HF PACKET OPERATION (not channelized BBS use, but "real Amateur radio QSO" style operation).

The AMD7910 modem does not provide good hooks for such a tuning indicator. The dual-filter type modems usually have such indicators built-in. The TAPR tuning indicator plugs right in to the TNC 1 and TNC 2 (and clones).

(5) ONE OF THE SECRETS OF SUCCESSFUL HF OPERATION IS TO QSY TO A "CLEAR" CHANNEL.

DO NOT TRY TO HOLD A PACKET QSO ON 14.107, or 14.103, or any other busy frequency. Just because packet users CAN share a channel does NOT imply that packet users must share a channel, or even that they should! The "hidden terminal" is a big problem on HF packet due to ionospheric propagation. Clustering on a single frequency will only aggravate the problem.

So, if you want to have enjoyable HF QSOs on packet, rather than endless frustration and more retries than you can easily count, the rules are simple:

1) Get a tuning indicator;

2) Get a narrow IF filter in your receiver, selectable in the SSB (or FSK) mode;

3) If you see a CQ (or send one) on a busy channel, get the other station to QSY to a clear spot BEFORE you exchange name, QTH, etc;

4) ENJOY!

Lyle

PS - I'll be talking about HF packet operation, and answering questions about this topic as well, at the Friday afternoon Packet session at Dayton this year. See you there!

- PRM -

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TAPR ANNUAL MEETING
February 21, 1987
Tucson, Arizona
+-----+

Reported by Scott Loftesness, W3VS, [76703,407]
Distributed via HamNet on CompuServe. Distribution
of this copy via the Amateur Radio packet network is
encouraged.

1. Introductions

Individual introductions were done -- about 60
people were in attendance at the beginning of the
meeting with another 20-30 joining later in the day.
Packeteers from the east coast (Massachusetts,
Virginia, Florida, etc.) to Hawaii were present at
the meeting.

2. Elections (new directors)

Harold Price, NK6K, and Tom Clark, W3IWI, were re-
elected to the TAPR Board of Directors. Three new
directors were elected to the TAPR Board: Dianne
Marshall, AL7FG; Bob Gregory, KB6QH; and Dave Toth,
VE3GYQ.

3. Officers

TAPR officers for 1987 are:

President: Lyle Johnson, WA7GXD
Exec. VP: Tom Clark, W3IWI
Secretary: Dianne Marshall, AL7FG
Treasurer: Terry Price, N6HBB

In addition, Dianne Marshall was appointed Business
Manager of TAPR.

4. Tribute to Pete Eaton, WB9FLW

(Note: Pete was unable to be in Tucson due to
illness.)

A plaque was presented by Andy Freeborn to Pete
Eaton, retiring TAPR board member and Executive
Vice-President, on behalf of the TAPR Board of
Directors with the following inscription...

PACKET PETE

During the period of 1982 to 1987 Peter J. Eaton
made outstanding contributions to the hobby of
Amateur Radio.

In his position as Executive Vice President of
T.A.P.R. he was instrumental in guiding many facets
of development of packet radio during its pioneer
years.

His unselfish personal sacrifices, dedication,
technical competence and management abilities were
of major importance in the development of a new
amateur communications mode.

Worldwide users of this new communications mode will
forever enjoy the results of his efforts.

Presented to Packet Pete Eaton on behalf of amateur

radio operators worldwide by the Members, Directors,
and Officers of Tucson Amateur Packet Radio with
deepest appreciation.

February 21st, 1987
Tucson, Arizona

5. Packet Radio Magazine - Gwyn Reedy, W1BEL

Jan/Feb issue just mailed (will be 40 pages rather
than 20-24 pages), more packet groups joining and
providing their local input to the magazine,
circulation holding steady at about 2,000, still in
process of applying for 2nd class postage permit
which will help speed delivery (currently sent via
third class). Gwyn has not deleted anyone from the
mailing list yet -- if an issue doesn't arrive, it's
probably the mail that didn't get through! If you
don't get the issue, let them know and they can send
a replacement. Done under the sponsorship of FADCA
- although separate financially. Bob WA6ERB asked
what type of input from the clubs was desired. Gwyn
commented that he doesn't get a lot of specific
feedback on what people want. People do call if
they don't get their issues - so they do care about
getting the magazine. Gwyn added that the size
limitations (1-2 pages) really make it a place for a
club to discuss what they are doing and to share
that with the rest of the packet world. It's not
especially effective if just directed to their
particular club members. Gene, KH6PP, asked if
unsolicited contributions would be welcome. Gwyn
says yes -- although the problem currently is that
there is more material available than can be printed
with the current financial structure. He is
especially interested in less philosophy and more
good technical material. A question was asked about
sending sample copies. Gwyn is willing to do this
but he can't do so on a free basis (costs over a \$1
to do so).

6. Packet in Government - Al Danis, WA6HGF, Chantilly, VA.

Al shared where the amateur radio contribution has
gone. Amateurs are clearly leading the way at the
highest levels of government -- as opposed to the
usual comments about amateur radio being in the dark
ages. Al's background is Army communications. The
link between voice radios used for tactical
communication and computers has been listening.
Concerns about monitoring has resulted in voice
radios moving to digital scrambling -- they are
digital radios. But can't run standard Bell 202
modems over these radios - must go in on digital
ports (typically 16kbps). In the UHF spectrum,
communications satellites are used but contain high
noise levels and high error rates. Had to go to
forward error correction to make effective use of
these facilities. Also had problems with the
relatively long delays (satellite, scramblers,
etc.). "Tempest" requirements to limit RF radiation
were tough challenges -- requiring placing the
packet TNCs in hardened steel boxes. Al brought two
of these Tempest shielded boxes containing TNCs (one
based on the TNC-1 and the other on the TNC-2). The
technology is being used to computer communications
for critical communications within the government.
Phil KA9Q commented that since the government users

of packet are so grateful, could they exert a little influence with the FCC supporting amateur radio (for example, commenting on the recent 220 MHz rulemaking proposal). The future: ease of use, lighter and smaller units, etc. Al estimated that it would have cost the government \$5 million to have done this development -- if they had even known that the technology was possible/available (vs. paying \$185 for the original TNC-2 that Al purchased). Sell for \$5,000 in quantity 1, 200 units in the field today, expect many, many more to be in the field in the next couple of years.

7. TEXNET - Bill Reed WDOETZ, Dallas TX

(TEXNET is being developed by the Texas Packet Radio Society)

Bill had briefly discussed TEXNET at last year's TAPR meeting -- and a lot has happened in the last year. See the several reports on TEXNET in the December issue of PRM.

8. NET/ROM - Mike Busch, W6IXU

Mike is well known in California for the W6IXU mailbox he operates from Arroyo Grande, California. Mike works with Ron Raikes, WA8DED (Ron is well known for the "DED" ROM's for the TAPR TNC-1). Mike and Ron work together professionally (for their company Software 2000 Inc.) writing professional networking software. They were looking for a break from their commercial activities and decided there was an opportunity to make a contribution in amateur radio networking.

NET/ROM is replacement firmware for the TAPR TNC-2 which transforms the TNC-2 into an NNC. It is designed for hilltop use (not for users at this time) and is intended for use by any AX.25 user station. It supports dual and multi-port nodes. It is written in C providing easy portability. NET/ROM's alpha-test version has been running in California on the 145.01 MHz long-haul digipeaters since January 11th. The beta-test version is scheduled for implementation in late February and will include a 220 MHz backbone plus use of a satellite "wormhole" to Virginia. The first generally available release, 1.0, is planned for general distribution in early April. It will be a commercial product, copyrighted (and not to be copied), and source code will NOT be available. Prices will be \$65 for the initial copy plus \$35 for additional copies for the same callsign owner. Product support will only be available via CompuServe (telephone support will not be available).

NET/ROM was developed to address the serious performance problems being encountered using AX.25 over long paths. NET/ROM implements true store and forward packet switching technology. Mike observed that there hasn't been any significant progress in 3 years, that networking efforts were going very slow and not really addressing the real problems. In addition, there is potential for commercial use of this technology - and amateur use provides an excellent test-bed.

NET/ROM requires an almost off the shelf TNC-2 (32K RAM is required). Running at the higher (4.9 MHz) clock speed is strongly recommended -- especially when running at 9600 bps. An upgrade of U3 is also recommended. A single wire addition is also recommended (it brings out a line from the TNC to a spare line (pin 23) on the RS-232 port).

NET/ROM is designed to be very easy for end-users to learn. A "connect" command is provided similar to that on the base TNC. A "nodes" command identifies nodes on the network. A "users" command (new in the beta version) is also provided which displays everything going on at the node (who's online, who they are talking to, etc.). Additional control operator commands are provided: "sysop" provides support for remote administrators to control a node; a special version of the "nodes" command to permit manual alteration of the network routing tables; a "parms" command is provided to permit the user (sysop) to control detailed parameter changes; an "ident" command permits assignment of a mnemonic code to be assigned to a node.

NET/ROM does include support for existing AX.25 technology including the digipeater functions.

NET/ROM includes automatic adaptive routing. Both manual and automatic updates are done to the network routing tables. A user requests access to a node and NET/ROM selects the "least cost" routing to the node. Dynamic re-routing is also provided -- i.e. a connection will be maintained in spite of a network failure occurs along the way. Nodes can have both callsigns and mnemonic node identifiers -- and the mnemonics can be used as aliases or synonyms for the callsign in any context. The mnemonics are NOT used on the air -- only the callsigns are used on the air.

NET/ROM implements two levels of error and flow control. The normal link layer error and flow control is provided. An end to end flow control at the transport layer is also provided. This is intended to prevent one circuit (user) from "hogging" all the bandwidth. An 8 frame sliding window protocol is used for error control. It implements a selective retransmission facility -- where only the frame in error needs to be resent.

Deferred disconnect logic is implemented in the beta version. It addresses a problem with a disconnect over a long path and handling of inflight information frames. Following a disconnect, NET/ROM will attempt to wait for the all inflight information frames to be received -- or wait for fifteen minutes with no forward progress on the inflight frames.

9. HF Modems - Eric Gustafson, N7CL

Eric has been doing a series of tests to 300 bps, 200 hz shift HF modems (see December '86 issue of PRM for more background). The results were published in the January/February '87 issue of PRM.

Eric's tests indicate only an 8% difference between the best and worst modems -- not a major difference in performance. His tests included the PK-232, the

PM-1, the AMD7910, and a reference demodulator using the Exar PLL chip.

Bottom line: spend your money first on an IF filter for your radio and on a tuning indicator! Modem differences aren't as significant as getting the IF bandwidth down.

10. TCP/IP Networking - Phil Karn, KA9Q

The TCP/IP protocols (also known as the Internet protocols) were developed to unify multiple systems/networks into a single network (from a user's perspective). TCP/IP was funded by DOD and has become a government standard. It also has become one of the de facto standards for commercial networking.

The notion is that network gateways are provided to actually accomplish the network interconnection. The approach has been to pick the least common denominator and use that to implement the network. It provides a uniform addressing scheme independent of any particular subnetwork. Fundamental transmission unit is the "Internet Datagram". IP Datagrams are switched by IP Gateways.

Phil reported on his TCP/IP for amateur application development work.

11. PSK Modem - Tom Clark, W3IWI

Tom has been working on a new 1200 bps PSK modem, designed for use with the Japanese JAS-1 amateur satellite. Tom reported on the design work (which has been completed) and announced that "95% complete (no cabinets or mechanical parts provided)" kits for building the modem will be available from TAPR soon at a cost of less than \$100. TAPR will be making an official announcement about modem availability, prices, etc. shortly.

Tom had a complete demonstration of the modem set up in the meeting room using the two initial prototype units of the modem.

12. TAPR Treasurer's Report - Terry Price, N6HBB

Terry presented the annual treasurer's report for TAPR. 1986 was essentially a "breakeven" year for TAPR with net income amounting to \$1,370.

13. Generic 'C' BBS - Dave Toth, VE3GYQ

Dave and Hank WORLI have been doing development work on a Packet BBS written in a portable development language suitable for porting to a variety of host computer systems. The BBS is getting close to an initial "production" release. Beta test versions have been available in the Compuserve HamNet DL9 Data Library and "testers" have been encouraged to download the code and implement it on their own systems. Feedback on problems and suggestions for improvements are encouraged. The bulk of the work to date has been done on the IBM PC using the Microsoft C Compiler, but additional ports are being done by others for the Apple Macintosh, OS9 and other systems.

14. PAKGRAM - Jay Nugent, WB8TKL

PAKGRAM is a program (written in 8080 assembler running on CP/M) intended to provide easier, automatic, and unattended operation for handling radiograms when sent through packet networks. Jay has defined a standard message definition protocol. Jay gave an update on his activities over the last year.

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number of club members, geographical area served. If you are an individual, perhaps your technical qualifications and/or experience will help.

The second paragraph usually sets the stage with background and an outline of your position. Referencing the Known position of others (the ARRL or other organizations) can help to show the unified stance of amateur radio or conversely, the unified stance of the opposition. The argument itself may be part of this paragraph if not too long or may follow in as many pages as needed.

The final paragraph should summarize your position and clearly state what you want the Commission to do. (no, not in those words!) On long documents, you may consider a summary as the second paragraph, with the final paragraph as the suggested FCC action.

Respectfully submitted,

name or name of club

address

Signature and title

date

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HAPN - continued from page 6.

3. The instructions will include an updated DISK1 with AX25 software that allows switching between 1200 and 4800 baud under program control.

4. We suggest participants to send a check or money order to HAPN of 50\$CAN or 40\$US for cost of the parts, diskette update, instructions and mailing.

5. For participants returning worthwhile feedback within 8 weeks (10 weeks outside of Canada) we give a 15\$CAN (10\$US) refund. If feedback is not received within this time the money will go into the general club funds.

We hope that you can participate and share in the excitement of building something to the advancement of packet radio and your fellow hams.

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TCP/IP A SLIGHTLY BIASED VIEW OF THE KA9Q NETWORKING SOFTWARE

Brian Lloyd, WB6RQN
Vice President, Engineering, MAPRC

There is a lot of talk about "improving" the network these days. How to improve reliability? How to provide for a better and more flexible routing system? While the debates rage, some determined folks in the packet community have actually put their ideas into code: the KA9Q TCP/IP code.

The KA9Q TCP/IP code is primarily the brainchild of Phil Karn, KA9Q. Phil, frustrated that the rest of the packet software development community didn't seem to be listening to his "farfetched" ideas on networking, proceeded to prove his point by actually implementing his ideas (a novel idea, no?). A small number of like-minded people soon joined him in his project (two people in particular, Bdale Garbee, N3EUA, and Mike Chepponis, K3MC, contributed considerably to the coding effort). The result is some frankly remarkable networking software.

The development process began with some hard discussion of what was really desired from the network in the way of services. The following list was compiled:

1. Electronic mail
2. File transfer
3. Remote log in (terminal to host and terminal to terminal)
4. An easy way to add other services besides the first three

The second step in the development process was to dispel the illusion that packet radio was "new" (read "invented by hams"). It turned out that, in fact, there was a large body of research having to do with existing packet radio systems (sorry fellow packeteers, we weren't the first -- not by a long shot). Because most of these systems were actually part of a larger network (the Internet, which includes ARPAnet, MILnet, DDN, and CSnet, among others) they had something important in common. The point of commonality was, and is, a suite of protocols loosely dubbed TCP/IP. The associated protocols include the File Transfer Protocol (FTP), the Simple Mail Transfer Protocol (SMTP), and TELNET (terminal-to-terminal and terminal-to-host communications). To Phil and the other developers of the KA9Q TCP/IP code, this suite of protocols seemed to be just what the doctor ordered. They provided the services desired, they worked together well, and they were already tested in a packet radio environment. Phil and company decided to use the existing TCP/IP protocol suite as the basis for a networking system for the amateur packet radio community.

Here's a simple rundown of how their system works. Let's have a sample scenario. You walk into the shack and sit down at your PC or clone that is running the TCP software. Last night you finished a program that you want to send to me. My Internet address is 44.96.0.1 so you issue the command 'ftp 44.96.0.1'. The net software tells you that a session has been established with my system so you use the 'put' command to send the file to me. In the meantime you wish to have a QSO with Phil Karn who has the network address 44.64.0.2. You press the escape key to get out of your current FTP session (no, this doesn't interfere with the file transfer in progress) and enter a TELNET session with 44.64.0.2. That's right, it is multi-user! While you are doing all these things other hams may be performing mail transfers, file transfers, and keyboard QSO's with you! You may switch between sessions at will. Black magic? Blue sky? Maybe in a year or two? Nope, now!

Not bad for one year's work, heh?. Now on to more of the nitty-gritty details.

The key to the whole shooting match is the functionality provided by TCP and IP. Since there has been quite a bit of discussion about "layer 3" I will add here that the Internet Protocol (IP) is a network or "layer 3" protocol. It was designed by some fairly smart folk who decided that they needed a networking protocol having the following characteristics:

1. simplicity
2. compatibility with any computer system regardless of vendor
3. compatibility with just about any sort of communications link regardless of quality
4. ability to transfer all types of data, i.e. files, digital voice, etc., with equal facility.

And it is all of these things.

Its major simplicity comes from the fact that IP does not guarantee to do anything. IP will try very hard to deliver your packets and, if unable, will try very hard to tell you why not. If you want to be sure that your message arrives at the other end, well, that becomes the responsibility of an upper layer protocol. An IP switch is very similar to our present day digipeaters except that the IP switch will either accept a source route (send it to B via C, D, E) or it can use its own routing tables (send it to B and you figure out the route -- I won't be bothered). Because IP is separate from the link protocol it can take advantage of reliability features built into the link protocol but will still work just fine without them.

Below IP comes the link layer. Does IP care what sort of link it has? No. As long as the link will

transfer IP packets it can be AX.25, Ethernet, smoke signals, or even two tin cans and a wet string. The key is that the link be able to transfer binary data to the other end with a probability greater than zero. It is also OK to tell IP that the next link can't handle large packets. IP will conveniently split or fragment the packets into smaller packets for reassembly into the original packet at the other end. This allows you to begin by sending large, efficient packets but to automatically "down shift" to conform to the limitations of other protocols that are being used to transfer data further down the line (like AX.25 has a limitation of 256 byte packets). Clever these computer scientists.

That is all well and good but what kind of links can the KA9Q TCP/IP handle? Phil's code comes with four different drivers. The first is a SLIP (Serial Line Internet Protocol) driver for point-to-point links such as between two machines in the same room or between two machines over the phone line (you can also use it between two systems using standard TNC's if you put the TNC's into transparent mode first). The second is an AX.25 driver that will drive a TNC running the KISS code produced by Mike Chepponis (also included with the distribution). The third driver is for the new Pac-Comm PC-100 card (not working just yet but Phil thinks it will be done shortly). The fourth driver is for the 3-Com Ethernet controller if you are rich enough to have one (they have been seen at computerfests for as little as \$100 and it is fun to see your data going back and forth between machines at 10 megabits per second).

Since we all like virtual circuits, e.g. a logical "telephone line" between here and there, The Transmission Control Protocol (TCP) is placed above IP to provide that service. TCP remembers what has been sent to the other end and will resend data if it should get lost. TCP provides many services, among them a service that resends only the data that has been lost and a service that adjusts the timing for retransmissions to accommodate long round trip times or periods of heavy channel loading. This reduces the load on the underlying network and reduces or eliminates such problems as having several people's TNC's retransmitting packets because the recipient couldn't send an ACK due to channel crowding. So TCP is a virtual circuit transport service.

Above TCP come the applications. TCP provides a mechanism called a socket for the connection of applications to the transport service. TCP controls sessions by combining a port number with the IP address to create a unique socket identifier. A socket, therefore, uniquely identifies a session between two programs, either local or remote. For convenience certain services reside at particular port addresses. This makes it very easy to find standard services such as FTP, SMTP, or TELNET. Since a port ID is a 16 bit number there are 65,536 possible ports leaving more than enough spare port ID's for future uses (for that matter there are over 28 trillion possible sockets).

What do you need to get up and running with this package? Well, you need an IBM-PC or clone with at least 128 Kb of RAM; MS-DOS or PC-DOS; a TNC-2, a VADCG TNC, or a Pac-Comm PC-100 card; and, of

course, the software. It is very easy to set up and get running. The instructions, while there are a lot of them, are not difficult to understand. Admittedly, this TCP/IP networking code is more complex than using your existing TNC to talk to the local bulletin board. But don't feel intimidated. If I can do it, so can you.

The last question is usually, "Is there anyone else out there to talk to?" Like packet in the beginning, there are not too many users yet. There are TCP/IP networks springing up in San Diego, Chicago, Denver/Colorado Springs, Seattle, Washington, DC, Pittsburg, Philadelphia, Northern New Jersey, Michigan, Kentucky, Maine, New Hampshire, and more are being added every day. The work is now to connect all these areas together into a single unified network.

Phil and company have made the KA9Q TCP/IP software available to amateurs at no cost for non-commercial purposes. If you are interested in getting a copy of the KA9Q software, please send your name, address, and \$5 (to cover the cost of the diskettes, postage, and handling) to me at my U.S. Postal Service address: Brian Lloyd, 19200 Tilford Way, Germantown, Maryland, 20874. I will send you -- as promptly as possible -- a pair of diskettes consisting of the network, mail, and TNC software (both source and executable), and full documentation. The disks are in standard MS-DOS format. The source for the mail and network code is written in 'C'. The KISS code for the TNC is written in Z-80 assembly language.

If you do not have the ability to program ROMs you can get the TNC bootloader code (needed to get the KISS TNC code into your TNC-2) already in a 2764 PROM for only \$10 from the same place as the rest of the code. We would appreciate it if you send us your old ROMs to help defray the costs of duplication but if you don't have a spare 2764 then don't worry about it.

For those of you who are concerned about compatibility with existing systems, relax. The data is transmitted over the air in the standard AX.25 protocol format (as demanded by the FCC). It is also possible for our IP network to make use of the many other mutually incompatible "layer 3" protocols that are being constructed around the world. Our IP network can take advantage of those links when they come into being.

For those of you who would like to take advantage of this networking code but do not have a PC or clone, again, do not fret. Work is underway to move this code to other machines including the Apple Macintosh and the Commodore Amiga. Work is also underway on the construction of multi-user BBS-like software that will allow you to connect using a standard TNC and take advantage of the features of TCP/IP. The KA9Q TCP/IP package will probably never be made to run on the Commodore 64 or the Apple][because of the limited capacity in these machines, but the source code is provided if you wish to try.

Continued on page 22.

Walter E Miller, AJ6T
PPRS President

SATELLITE "WORMHOLE" LINKS WESTNET AND EASTNET

A very unexpected and exciting satellite packet link between the West Coast and East Coast popped into existence early in January. Brian, K6OJM, obtained permission from his employer (Vitalink) to tap into some unused capacity on a commercial geosynchronous satellite for amateur radio experimentation. A 56 Kbit channel is available, but only a small portion of it is currently used to transmit TNC audio back and forth between WESTNET and EASTNET outlets at each end of the link. Two amateur digipeaters with the same callsign (WA3YMH-1) are linked via the satellite. To other stations, it appears as if WA3YMH-1 is a single digi which can see both EASTNET and WESTNET simultaneously. TNCs with WA8DED version 1.0 firmware are used at both ends of the link. Initially, both ends had outputs on 145.01 MHz, but as of late January the EASTNET end had moved to 145.07 where it is serviced by N4QQ BBS. The WESTNET terminus is still on .01 as of this writing, and it sees W6AMT digipeater in San Jose. The EASTNET WA3YMH-1 is located at the Computer Science building at the University of Maryland, and the WESTNET WA3YMH-1 is at Vitalink in Mountain View. All of the hardware (rack, tnc, radio and QPSK satellite modems) was assembled here in California and shipped to Louie, WA3YMH-1, for installation in Maryland. There is a .25 second time delay in the link due to the long path length through the satellite.

The name "WORMHOLE" for this type of operation stems from the analogy between the theoretical wormholes which may bridge black holes and white holes in cosmological physics. The name was quite apropos during the first few days of operation, since most packets seemed to be sucked away (never to be ackd) into oblivion. The channel was severely overloaded and retries and collisions were rampant, largely due to the tremendous load of BBS packets on 145.01 MHz. A few operators were overcome with DX fever, and attempted multidigipeater hops through the wormhole. However, quite a few coast-to-coast VHF QSOs were made, and some BBS autoforwarding was also successful. A few savvy ops sent unproto packets into the abyss and got responses from the other side. Now that the EASTNET end has moved to 145.07, the congestion is much lower and QSOs are less frenzied. N4QQ BBS services the East coast side of the wormhole. The PPRS BoD has recommended that the WESTNET end be moved to 223.58 MHz to allow for BBS autoforwarding between the two coasts. K6OJM will speak at the February PPRS meeting and bring us up to date on this very exciting link.

LEVELS 3 AND 4 ARRIVE AT WESTNET!

January has been a terrific month for packet news here in California. Not only did the satellite wormhole open up, but the rumored WA8DED networking software has finally made an appearance. Ron's 27C256 "NET/ROM" plugs into a TNC2 (or clone) and transforms it into a network node controller which works both as an ordinary AX.25 digipeater and as a virtual circuit controller with node-to-node acks. W6AMT-0,1,2,3 and other Southern California digipeaters have been outfitted with new EPROMs, and a bone fide level 3 network is now appearing on WESTNET. To use this new facility, a user connects to the local node (W6AMT-0 in the SF Bay Area) and requests a connection to another node or to another user. All acks are handled on a node-to-node basis; there is no need for a packet to be digipeated all the way to its destination and for an ack to return via the same long route. This dramatically reduces circuit congestion and improves throughput. To establish a connection to a distant station (W6XYZ) whose local node is W6AMT-3, a Northern California ham first connects to W6AMT, then requests that W6AMT establish a link to W6AMT-3, and then requests that W6AMT-3 connect to W6XYZ. If W6XYZ cannot be reached, W6AMT-3 will report failure. The following text was copied off the air, and shows how K1HTV connected through the WA3YMH-1 wormhole to W6AMT, then to W6AMT-1, and finally to W6IXU BBS:

```
cmd:c w6amt v wa3ymh-1
*** CONNECTED to W6AMT
c w6amt-1
W6AMT} Connected to W6AMT-1
c w6ixu
W6AMT-1} Connected to W6IXU
K1HTV logged onto W6IXU MulBox port A2 on Saturday
24-Jan-87 at 8:03 PM
```

A NET/ROM node can automatically update its routing table, or new information can be entered by the system operator (via a local terminal or remotely over the air). Node-to-node frames carry a new Protocol Identification (PID=CF). The "NODES" command will cause the NET/ROM node to list the other nodes for which it has routing information. In the following example, I connect to W6AMT and request its list of known nodes:

```
* CHANNEL NOT CONNECTED *
* c w6amt
* CONNECTED TO W6AMT *
nodes
W6AMT} Nodes:
W6AMT-1 W6AMT-2 W6AMT-3
```

Quoting from the NET/ROM Users Manual: "NET/ROM uses the standard AX.25v2 packet radio protocol for

links between neighboring nodes, as well as for links from each node to its local users. Normal AX.25v2 error handling is used to assure error-free transmission, and normal AX.25v2 flow control is used to manage network congestion. In addition, NET/ROM incorporates a transport-level 'sliding window protocol' to provide end-to-end error and flow control for each virtual circuit. End-to-end error control protects against lost, duplicate, or out-of-sequence frames resulting from node failures and dynamic routing changes. End-to-end flow control protects the network against disproportionate loading by any one circuit."

When "downlinking" from the network node to the remote user, the node "adopts" your callsign with a new SSID equal to 15-N (where N is your original SSID). Watching the headers go by can be quite confusing! The nodes identify themselves regularly to comply with FCC regulations. Node callsigns are burned into the EPROM. This firmware is in the alpha test stage now, and changes and improvements are sure to follow soon. NET/ROM is for digipeaters only, and serves no purpose in a user or BBS TNC. NET/ROM firmware is available for sale from Software 2000 Inc, and will not be distributed free of charge.

By all means take advantage of this new networking capability. Do not use a network node as an ordinary digipeater. If necessary, digipeat into the node and connect to it. Then connect to the remote node which will serve as your "downlink" and finally tell that node to establish the connection you desire. Your throughput will increase dramatically compared to regular digipeating. If you digipeat through a network node, you are creating unnecessary QRM for everyone else on the channel.

WB6WEY VISITS BAY AREA

WB6WEY, newsletter chairman of the Southern California Digital Communications Club, met recently with PPRS/EBPRA members NI6A, N6FQR and WD6CMU. Orv reported on Southern California efforts at high speed backbones on 50 and 220 MHz, and shared information on K9NG modems and Midland 13-509 mods. He said that KA6IQA at the Linkabit facility near San Diego has a commercial satellite gateway almost operational, but lacks a user interface at the D.C. end. All agreed that closer contact between the Northern and Southern California packet clubs would be useful to encourage more effective experimentation. I will attempt to maintain contact with WB6WEY and keep the information channels open.

WD6CMU EXPERIMENTAL BBS IN OPERATION

Eric, WD6CMU, is running an experimental BBS in Richmond on 145.05 and 145.09 MHz. This is the same system he demonstrated at the December PPRS meeting. His C code runs on a single board 68008 computer and features multiconnect capability. Eric may maintain a data base of user nodes which can be queried automatically.

OTHER PPRS NEWS

Ted, N6IIU, is considering adding a port on 223.60 to allow novices access into our packet system. This is a result of the recent FCC novice enhancement proceedings. Ted is also considering calling another BBS sysop meeting in light of the developing 223.58 BBS backbone. BBS on that backbone frequency now include: AA4RE-1, N6IIU-1, WORLI, W6PW-3, WA6NWE-1 and N2DME. W6AMT is still the only digipeater on that channel, but others are expected very soon.

WESTNET UPDATE

Norcal BBSs continue to migrate to the 223.58 Mhz 1200 baud backbone channel for their autoforwarding. W6PW-3, WORLI, WD6CMU, AA4RE, N6IIU-1, N2DME, WA6NWE-1, and N6HAV are already there. The EBPRA has joined with another group to put up WB6BDD-1 digipeater on Mt. Diablo, and this has greatly increased the range of the 220 network. PPRS provided the MFJ1270 TNC2 clone for this station. Unfortunately, it overlaps a large part of the coverage provided by the only other high level digi on that channel, W6AMT. More 223.58 digis are needed to service some of the remote Norcal BBS. The backbone forwarding has greatly reduced congestion on 145.01, but 145.01 is still very busy.

Alpha testing of level 3 NET/ROM continues on W6AMT and W6AMT-1 (and other Southern California nodes). W6AMT-11 is the 223.58 dual ported NET/ROM station linked to W6AMT-1, and W6AMT-10 is slated to be dual ported to W6AMT-0 very shortly. PPRS has provided the TNCs at AMT-10 and -11. Installation of Beta test NET/ROMS has been delayed a few weeks to allow some bugs to be ironed out. If you are attempting long haul connections to Southern California, please use the level 3 NET/ROM rather than regular digipeating through the same nodes. The throughput and efficiency are much better with NET/ROM due to fewer retries.

The commercial satellite WORMHOLE link to the East Coast has been up and down over the past few weeks, mostly due to hardware problems on the eastern side of the channel. When the link is up, WORLI BBS forwards with N4QQ BBS in Maryland. The West Coast end of the WORMHOLE will probably move from 145.01 to 223.58 eventually.

The new Novice Enhancement regulations will be effective at the end of March. N6IIU is planning to install a Novice port to his BBS on 223.60, and rumor has it that W6PW-3 in SF will also have a Novice port. Novices have new privileges (including packet and voice) on 28, 220 and 1270 Mhz.

KH6WY in Hawaii is now linked to WESTNET via WORLI on 14.109, and messages are also showing up from VK2XY and VK4BBS.

The new WORLI C BBS program is being updated almost weekly. The latest version can take advantage of the NET/ROM level 3 capability.

The WD6CMU BBS code also continues to be enhanced. Eric's station can now be used to run applications programs (such as the DL6WU Yagi design program) for users. WD6CMU BBS also provides a "White Pages" program which lists a users home BBS.

PPRS MEETING INFORMATION

The speaker at the February PPRS meeting was Brian, K6QJM. He and KG6YC and WB6FFC at VitaLink were responsible for setting up the coast-to-coast WORMHOLE commercial satellite link. WA3YMH handled the East Coast side of the connection. Brian gave a very interesting slide and photo presentation. The geosynchronous satellite is SBS4, operating at Ku band (14 GHz). The California end has a 3.3 meter dish and 56 Kbit Radyne QPSK modems. The link is susceptible to rain fading. Audio summing is used, so there are collisions that occur in the satellite audio channel. The audio levels had to be jockeyed just right to make the link work properly.

Larry, N7EQN, was the speaker at the PPRS March meeting. He is in charge of the local National Weather Service office and is SKYWARN coordinator for California. SKYWARN provides daily weather reports which are forwarded to several Norcal BBS, and issues weather warnings when severe conditions are predicted. The N7EQN BBS on 145.05 accepts weather reports from amateurs for forwarding to the NWS. Larry has distributed raingauges to hams to facilitate receipt of accurate information. This automatic packet system is the only one of its kind in the U.S., and Larry has received many inquiries from other states. The system runs on an IBM PC using PROCComm (version 2.42) script files to automatically download data from the NWS mainframe (via telephone modem) and then switch to BBS packet upload in another partition. After N7EQN's presentation, the meeting broke up into smaller discussion groups lead by WB6ASR (networking), N6KL (emergency packet operation) and AJ6T (beginners session).

PPRS has extended an invitation to Mike, W6IXU, to speak at the April 7th meeting. Mike and Ron, WA8DED, designed the new NET/ROM level 3/4 code which is currently running on the AMT network. This should be a very exciting presentation. PPRS meetings are held the first Tuesday every month at 7:30 pm at the AMPLEX cafeteria in Redwood City.

NORCAL BBS SYSOPS MEETING (7MAR87) IN PALO ALTO

Another meeting of the Norcal BBS sysops was called by Ted, N6IIU. Although the same group met fairly recently (November 86), this meeting was necessary to resolve new problems regarding 223.58 forwarding and some other issues. The prepared agenda included: Use of 223.58; BBS frequencies in new 2 meter subband; BBS user policies; new multi-port software; SKYWARN. Additional topics added at meeting time were: WD6CMU "White Pages"; N6KL FINDER presentation; TAPR annual meeting discussion; Novice Enhancement discussion; consideration of user time limit on BBS.

The attendees were: N6IIU, KE6BX, W3VS, AA4RE, KB6BA, N6OIM, N4CHV, WORLI, N6IYA, AJ6T, N6FQR, WD6CMU, WA6NWE, K6RTV, K6QIF, N7EQN, KE6AD, K9AT,

WB9LOZ, WB6ASR, KB6FED, N6KL, N2DME, NI6A, N6JLJ, N6EEG.

Ted had asked the sysops to bring their user and forwarding files; some of these files were distributed to everyone present. Ted also handed out a "How to Use a BBS" sheet. The meeting began with a discussion of "BBS roamers" (stations who check into many different BBS). There was a lot of support for the concept of a "local BBS" (each user would only connect to his local BBS). AJ6T pointed out that the urge to connect to multiple BBS would be hard to stop since all BBS do not have the same files. There were complaints about large and uninteresting files which choke the network.

The main reason for this meeting was concern over the evolution of the 223.58 backbone. At the last meeting in November, this channel was reserved as a private frequency where BBS autoforwarding could take place without interference to or from keyboard users. Since then, the emergence of the dual port (145.01/223.58) NET/ROM nodes on AMT had caused consternation among some sysops, since the "private" BBS backbone would also carry user traffic. AA4RE suggested that we allow dual porting and push the 223.58 NET/ROM channel to the limit and then backoff when it becomes overcongested. A long, rambling discussion of networking followed. Brad, KB6FED, pointed out that the types of network problems we are considering were solved in the commercial world many years ago. AJ6T made a motion that the sense of the meeting was: 1) 223.58 was intended primarily as a BBS forwarding channel; 2) BBS sysops would discourage user connections on 223.58; 3) the sysops would encourage the AMT group to install full dual ported NET/ROM TNCs at all AMT sites; 4) the sysops will exclude from their forwarding files other BBS which do not abide by this agreement (i.e., those that encourage user connections on the backbone). This motion carried almost unanimously (NI6A was the only no vote). Greg, WB6ASR, trustee of W6AMT, asked that the sysops keep him apprised of the situation on 223.58, and he pointed out that new technology (such as higher speeds) will force a reconsideration of these problems in the near future.

A long discussion of ALLMB and MBALL forwarding resulted in the recommendation that WD6CMU write new code for his BBS to act as a hub for redistribution of messages which are to be sent to all BBS in Northern California. This will allow users to enter messages such as "SP QST @ NORCAL" at a local BBS. Such a message would be forwarded to WD6CMU, and then redistributed to all NORCAL BBS. One problem with this approach is that the message is forwarded back and forth twice over the same path. Watch your local BBS for more information on this new routing scheme.

AA4RE and KE6BX are moving to 144.99 MHz. WA6RDH is a new 145.01 BBS which will forward to WD6BFC (these are the last of the 145.01 BBS). WD6CMU and WORLI are major hubs in the new Norcal routing plan. WD6CMU will link south to W6IXU. WORLI will service the WORMHOLE and provide an HF outlet. WORLI reported that he is considering making a Novice port on 10 meters.

The new "mirror image" 2 meter channels were assigned as follows. 144.99 for W6PW-3 and AA4RE. 144.97 for WD6CMU. 144.95 for W6CUS (tentative-if voice traffic is really clear of this channel). 144.93 for Monterey Bay intertie. 144.91 for key-board users.

No general agreement was reached on adoption of a new BBS policy regarding user assignment to a single LAN, although there was strong opposition to operators who connect to every possible BBS. Andy, N6JLJ, suggested these courtesy guidelines: 1. Stay at your home BBS; 2. Limit your connect time; 3. Use the minimum practical power. There was no agreement regarding a limitation on number of allowed digipeat hops into a BBS, and there was no agreement on whether BBS sysops should allow their stations to be used as digipeaters. There was agreement to adopt the standard NK6K header for forwarded messages.

Scott, W3VS, described the presentations at the recent TAPR annual meeting in Tuscon. The major topics were TEXN II, NET/ROM (by W6IXU), TCP/IP (by Phil Karn), FOI2 PSK modem (by Tom Clark, W3IWI), WORLI software demo (by VE3GYQ), miniature Japanese TNC2 clone (which uses SMT and is small enough to mount on the back of an HT), Digital Signal Processing (DSP, by W3IWI), and government use of TEMPEST hardened (!) TNC1 and TNC2 clones. WORLI reported that the TAPR NNC project was in limbo.

Keith, K6QI, suggested that the next sysop meeting be held on May 30th at a swapfest in Sacramento.

After the meeting, some of the attendees toured through N6IIU-1 BBS, located at the Palo Alto Red Cross.

REPORT FROM NARCC MEETING, 7MARCH87

George, WB6RAL (NARCC and PPRS frequency coordinator), attended the NARCC meeting on March 7th and reports that the only packet news is that no new 223 Mhz channels were allocated, and that existing packet channels between 221.0 and 221.1 will be divided into 1200 baud assignments to carry expected traffic.

PPRS annual dues are \$18. Please join or renew ASAP to keep your Packet Radio Magazine subscription current and to support PPRS plans for TNC loans to 220 Mhz digipeater operators. The PPRS mailing address is PO Box 51562, Palo Alto, CA 94303. PPRS general meetings are held the first Tuesday of each month at 7:30 pm at the Ampex cafeteria (411 Broadway, Redwood City). Watch for meeting announcements early each month via beacons from W6AMT on 145.01 MHz. PPRS BoD meetings are held the third Thursday each month at AJ6Ts home in San Jose.

- PRM -

MARDA - continued from page 7.

tentative to attend any of ALANET's regional meetings. In order for a NETWORK to flourish, dialogue must be established among those participating.

I know most of the PACKETEERS in the Mobile area and find them all to be a very enthusiastic and hospitable group. But I have also discovered there is a big misconception regarding the main purpose of a BBS. There are some that believe all BBSs should get off 145.01. I can't say that I disagree with this statement but you have to learn to WALK before you can RUN. As mentioned earlier, the path between MARDA and ALANET is marginal on 145.01. If the BBSs move off this frequency mail forwarding will be non-existent.

In order for a LAN to thrive you have to furnish a DIGI and BBS to serve the users. The purpose for which the LAN is created will be defeated if either of these ingredients are omitted. If the LAN user can't connect to his buddy or reach the nearest BBS, he/she will return to the TRUNK where the activity is abundant.

I was recently told that BBSs are QRM generators. The truth is ... the users create the QRM. King BBSs is often found here on the Gulf Coast between Mississippi and Alabama because WA5DVV-1 is the only BBS serving these areas. If each adjacent LAN (Mobile/Pensacola) had their own system, this QRM as it is called, would be substantially reduced. Then the only BBS traffic on 145.01 would be machine speed message forwarding. All users would access their LOCAL BBS from the LAN side keeping local activity off the trunk. Once these conditions have been met then a backbone NET can be implemented. But here we go again ... if you put up a backbone then you need a way to store and forward messages.

I hope that someone will pick up the ball and volunteer to put a BBS online in Mobile and a DIGI/BBS in Pensacola. Both of these areas are slow in building. A few dedicated packeteers can accomplish a lot in a short amount of time when working together ... but you have to take the FIRST step.

Until next month, may all your CONNECTS be many and RETRIES few.

- PRM -

TCP/IP continued from page 18.

I believe the KA9Q software represents a tremendous achievement: truly a significant cut above what else has been accomplished in the amateur packet radio networking area at this time. I hope that you will take advantage of the opportunity to experiment with this exceptional networking software.

Oh, and Hey Phil ... Thanks!

- PRM -

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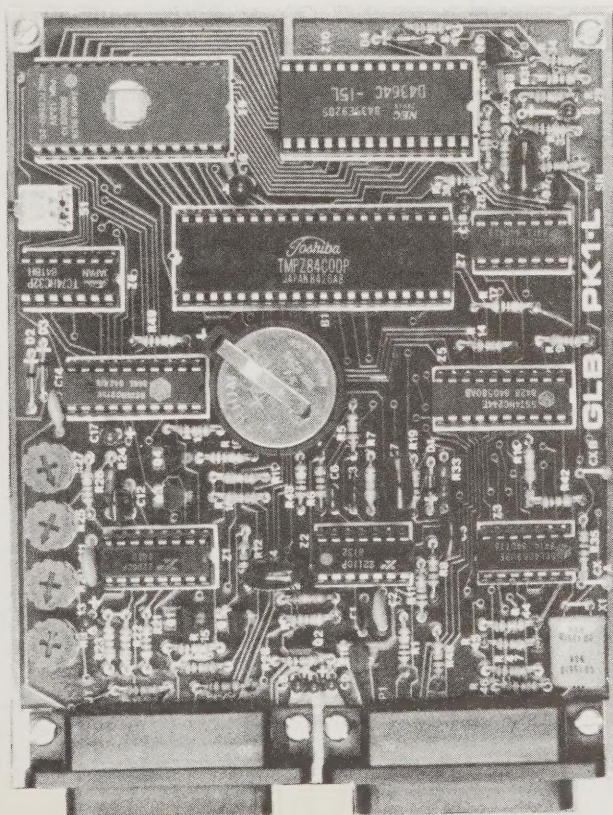
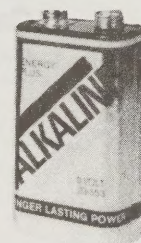
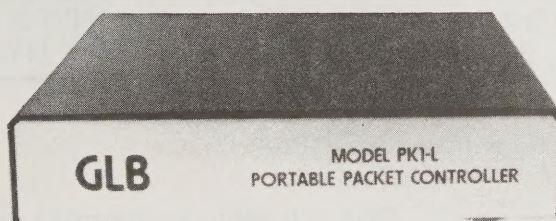
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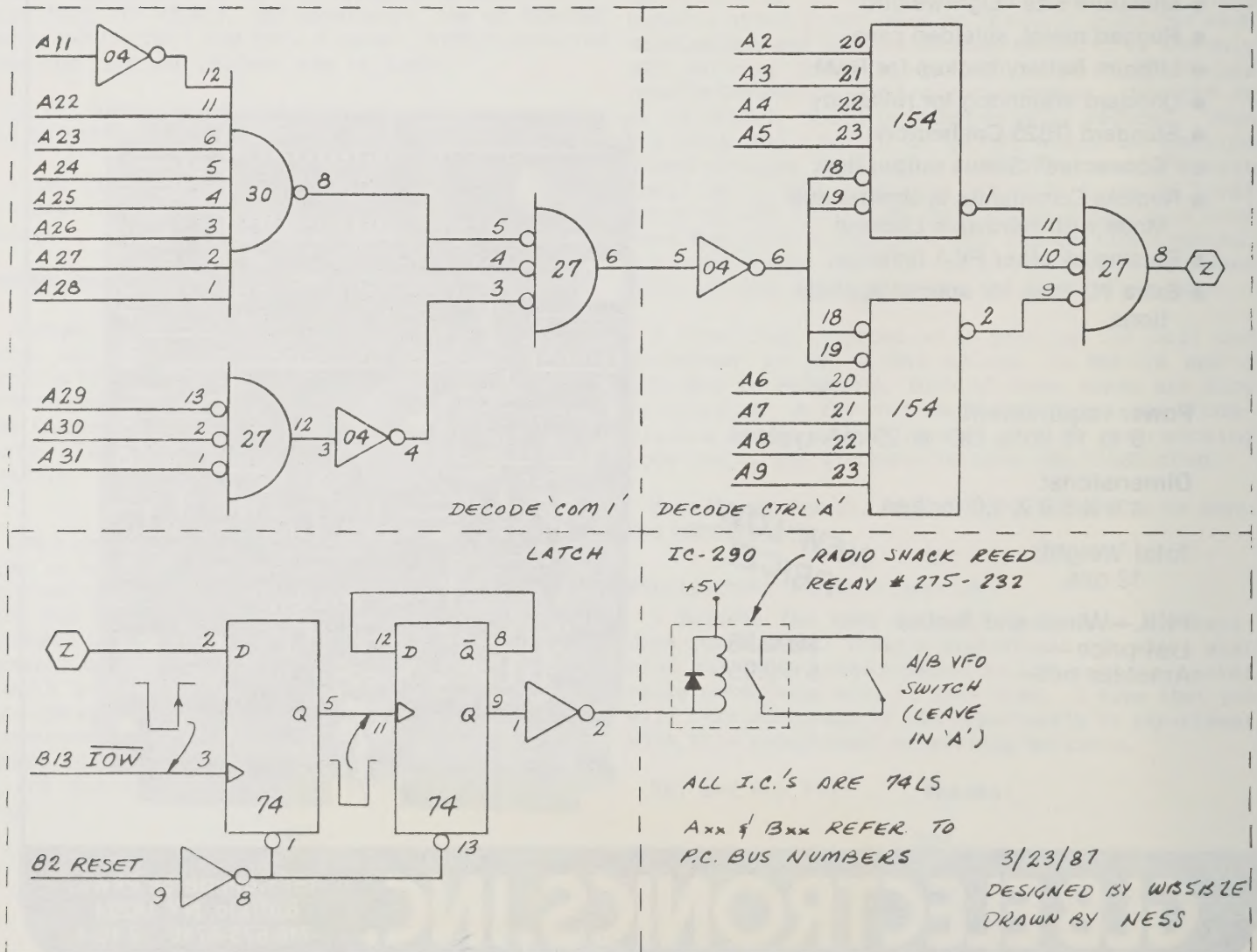
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This Schematic Accompanies the Article on page 12.

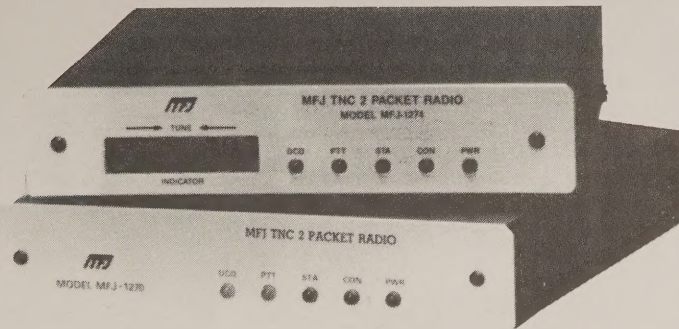


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